

Dependent Claim 4 calls for delivering air in a specific temperature range and gripping portions of the bag adjacent opposite sides of the segment of the bag against which the stream of air impinges.

Applicant respectfully urges that no reference of record or any combination thereof suggest the method defined by Claim 1-4 and it is respectfully urged that the claimed invention is novel and defines inventive steps not suggested by the references.

Claim 5 calls for gripping the bag at spaced positions adjacent the row of perforations; and directing temperature controlled air to impinge against the bag between the gripped portions for forming a seal adjacent the row of perforations. This method is not suggested by the cited references when considered separately or in combination.

Claims 1-10 call for means for gripping spaced portions of the bag, for example between belts 241 and 251 and between belts 243 and 253, as illustrated in Figure 16 of the drawing, and means for delivering temperature controlled gas to impinge against the surface of the bag between the gripped portions for fusing portions of the bag between the gripped portions to form a sealed strip. This structure is not suggested by any reference of record or any combination thereof.

Claim 11 calls for a pair of upper belts 241 and 243 and a pair of lower belts 251 and 253, as illustrated in Figure 16, positioned such that a portion of the bag neck bridges space between the upper pair of belts and the lower pair of belts; and upper and lower air dispensers 265 and 275 positioned to deliver heated air to impinge against upper and lower surfaces of the portion of the bag neck bridging between the belts for melting and forming a sealed strip across the entire width of the bag neck for forming a seal extending generally parallel to a row of perforations formed in the bag neck. The cited references do not suggest the combination of elements called for in Claim 11 and it is respectfully urged that the claim defines an inventive step which is not obvious to a person skilled in the art.

It is respectfully urged that the proposed amendments be entered to more clearly distinguish over the references cited by the examiner.

Canadian Patent No. CA2064270 to Davis, at page 7 states that in the particular arrangement shown in Figures 2 and 2B the heat sealers comprise rotating heat seal wheels, one of which is provided with unheated serrating teeth 18. These teeth pre-score the bag as indicated at 20 immediately beneath the heat seal 19. The patent further states that in addition, heat seal wheels 17 are divided into an upper heated wheel portion 17C and a lower unheated wheel portion 17D. The upper heat wheel portion performs the heat sealing operation. The lower unheated wheel portion

includes an embossed bag coder which applies a bag code 22 beneath the serration as seen in Figure 2C.

Trimble U. S. Patent No. 5,600,938 discloses, at column 3, lines 1-29 a movable plate (Figures 2 and 3) provided with a plurality of heated pins 22. A cam follower moves the movable plate down quickly to push the heated pins into the silicon pad 38, thus penetrating the two layers of the open end of the plastic bag and sealing spaced spots across the open end of the bag, from the forward edge of the bag to the rearward edge as shown in Figures 1A and 6B. As described at column 3, lines 45-50, the seal tends to be a doughnut-shaped seal joining the two layers 68 and 66 of plastic together in a generally doughnut-shaped hole 69. These holes are spaced across the open end of the bag as shown in Figures 1A and 6B leaving air passages between the unsealed layers of plastic. At column 4, line 42, the patent to Trimble states that complete opening of the bag can be revealed if the welded spots are separated. The spots will separate without disintegrating the entire bag so that once opened, the bag can be re-closed by gathering the neck of the bag and attaching the reusable closing device to the neck of the bag.

Saget et al U. S. Patent No. 5,816,019 discloses a heat-sealing machine which is described at column 5, line 25 as including a nozzle 3 having a nose 11 in the form of a parallelepiped of substantially rectangular cross section defined by a top face 12 directed toward a top sheet 2a and a bottom face 13 directed toward a bottom sheet 2b. Nozzle 3 has side faces 14 and 15, side face 14 facing toward guide means 5 and side face 15 facing toward presser means 4. As described at column 5, line 62, nozzle 3 includes perforations 20 formed in at least one of the faces 12, 13 and 15. The disclosure states that the hot air must travel vertically toward the top sheet 2a and toward the bottom sheet 2b and it must also travel horizontally toward the presser means 4. Top sheet 2a and bottom sheet 2b are guided so that they face each other and are spaced apart from each other, such that when they pass nozzle 3 it lies between the two facing pieces 2a and 2b to be sealed. At column 3, lines 26-44, Saget et al states that top sheet 2a and bottom sheet 2b are pressed against each other by rollers 4a and 4b, as illustrated in Figures 1 and 2.

The method and apparatus disclosed in the cited references require physical contact with the sheets for forming a seal. The physical contact between the heated sheets at a nip between rollers engaging upper and lower surfaces of the sheets causes softened plastic material and ink to adhere to the surface of the rollers and/or heated pins. The softened plastic and ink tend to accumulate and

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build up on the structure which requires time-consuming maintenance and inferior sealing. The build-up of material on rollers and other heated surfaces contacting the sheets may cause the built up layer of material to be offset onto the packaging material. Further, the accumulation of material on the surfaces causes the heat transfer rate to vary.

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Having described the invention, we claim:

1. A method of forming a tamper resistant seal on a plastic bag containing a loaf of bread comprising the steps of:

flattening a portion of the neck of the bag adjacent the open end of the bag;  
positioning a segment of the flattened portion to bridge between spaced grippers;  
heating the segment spanning between the grippers to a temperature sufficient for bonding material forming the neck of the bag such that the product in the bag is not accessible;  
gathering the flattened portion of the bag between the seal segment and the product; and  
attaching a reusable closure to said neck.

2. A method according to Claim 1 with the addition of the step of perforating the bag between the secured segment and the product in the bag for forming a strip of perforations.

3. The method of Claim 1 wherein the step of securing at least a segment of the flattened portion of the neck of the bag comprises moving the neck of the bag such that streams of heated air impinge on the surface of the bag for fusing panels on the bag together to form a sealed strip.

4. The method of Claim 1 wherein the step of securing at least a segment of the flattened portion of the bag comprises the steps of:  
delivering air heated to a temperature in a range between about 315° and 600° Fahrenheit in a stream to impinge against the surface of the bag; and  
gripping portions of the bag adjacent opposite sides of the segment of the bag against which the stream of air impinges.

5. A method for forming a tamper resistant closure on a plastic bag containing a product comprising the steps of:  
forming a row of perforations in the bag;  
gripping the bag at spaced positions adjacent the row of perforations; and  
directing temperature controlled air to impinge against the bag between the gripped positions for forming a sealed strip adjacent the row of perforations.